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09/910,587	07/20/2001	Randal G. Martin	062986.0214	1407

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EXAMINER	
HAILE, FEBEN	
ART UNIT	**PAPER NUMBER**
2616	

DATE MAILED: 10/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/910,587	MARTIN ET AL.	
	Examiner	Art Unit	
	Feben M. Haile	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-18 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-18 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doshi et al. (US 5,222,061), hereinafter referred to as Doshi, in view of Forin (US 6,594,701), and in view of Jones et al. (US 6,944,173), hereinafter referred to as Jones.

Regarding claim 1, Doshi discloses the limitations: generating a first sequence number **(figure 1 unit 125 and column 3 lines 10-16; a sequence number generator produces a count value)**; inserting the first sequence number into the data packet **(figure 1 unit 120 and column 3 lines 17-20; a controller accepts the count value and adds it to a data packet as a packet sequence number)**, generating a second data packet in a packet flow **(figure 1 unit 120 and column 3 lines 17-20; a controller accepts the count value and adds it to a data packet as a packet sequence number)**; generating a second sequence number **(column 3 lines 12-20; the sequence number generator advances the count value to a succeeding number)**; inserting the second sequence number into the second data packet **(figure 1 unit 120 and column 3 lines 17-20; a controller accepts the count value and adds it to a data packet as a packet sequence number)**.

Doshi, however, fails to teach the limitations: generating data packets in response to flow control credits.

Forin discloses a receiver communicating credits to a sender and the sender constructing data packets based on these credits **(column 12 lines 50-53)**.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate Forin's credit list builder and reader into Doshi's transmitter and receiver. The motivation for such a modification being to eliminate data being lost, data being overwritten, and/or data being retransmitted due to the transmitter sending too much data to the receiver.

Neither Doshi, Forin, or their combination fail to further teach the limitations: selecting a first one of a plurality of channels to transfer the data packet according to channel capacities of the plurality of channels; transferring the first data packet over the selected first one of the plurality of channels; selecting a second one of a plurality of channels to transfer the second data packet according to the channel capacities of the plurality of channels; transferring the second data packet of the packet flow over the selected second one of the plurality of channels, the second one of the plurality of channels being different than the first one of the plurality of channels as a result of varying channel capacities among the plurality of channels.

Jones discloses a receiver sending a credit packet to a transmitter bearing an assigned virtual channel for data transmission **(column 2 lines 45-47 and column 3 lines 19-21)**, where each data packet can only be transmitted to the receiver when a credit packet is issued **(column 3 lines 30-32)**; the transmitter sending data to the

receiver on the virtual channels designated by the credit packets **(column 2 lines 48-51)**, where transmitting data via the plurality of virtual channels results in a more efficient use of bandwidth **(column 1 lines 55-58)**. Although Jones does not explicitly teach varying the bandwidth among the plurality of virtual channels, that particular feature is apparent.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the element of Jones's receiver for sending credit packets to designate a particular virtual channel for transmission from a transmitter into the receiver of both Doshi and Forin. The motivation for such a modification is to provide an improved method and system for transmitting data via a plurality of virtual channels using a more efficient bandwidth.

Regarding claim 2, Doshi discloses the limitations: incrementing the sequence number in response to transfer of the data packet **(column 3 lines 12-16; the sequence number generator advances the count value to a succeeding number)**.

Regarding clam 3, Forin disclose the limitations: decrementing a number of flow control credits in response to transfer of the data packet **(column 12 lines 47-50; a credit list reader/processor removes a credit from a list once a sender uses that particular credit)**.

Regarding claim 4, Forin disclose the limitations: receiving a reply, the reply including flow control credit **(column 17 lines 21-23; the credit list reader/processor receives a credit list and processes the credits in order to send data to a receiver);** incrementing a number of flow control credits in response to receipt of the

reply **(column 18 lines 15-21; a credit list builder/communicator communicates a new credit list to the sender when it determines that the data has been received)**.

Regarding claim 5, Doshi discloses resetting the sequence number to an initial value **(column 3 lines 10-16; the sequence number generator is a counter, it is obvious to one of ordinary skill in the art that once a counter reaches its maximum number it will reset itself to its original number)**.

Regarding claim 6, Doshi discloses the limitations: sequence number unit operable to generate a first sequence number **(figure 1 unit 125 and column 3 lines 10-16; a sequence number generator produces a count value)**; the request channel controller operable to insert the first sequence number into the first data packet **(figure 1 unit 120 and column 3 lines 17-20; a controller accepts the count value and adds it to a data packet as a packet sequence number)**, the request channel controller operable to insert a second sequence number into the second data packet **(column 3 lines 12-20; the sequence number generator advances the count value to a succeeding number and figure 1 unit 120 and column 3 lines 17-20; a controller accepts the count value and adds it to a data packet as a packet sequence number)**.

Doshi, however, fails to teach the limitation: a request channel controller operable to receive a data packet in response to a flow control credit.

Forin discloses a receiver communicating credits to a sender to control the flow of data packets sent by the sender **(column 11 lines 62-64)**.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate Forin's credit list builder and reader into Doshi's transmitter and receiver. The motivation for such a modification is to provide an improved method and system for controlling flow between a sender and receiver that alleviate the difficulties of data being lost, overwritten, and/or retransmitted with conventional flow control techniques.

Neither Doshi, Forin, or their combination fail to further teach the limitations: the request channel controller operable to select a first one of plurality request channels according to channel capacities of the plurality of request channels, the request channel controller operable to transfer the first data packet over the selected first one of the plurality of request channels, the request channel controller operable to receive a second data packet in the packet flow in response to a second flow control credit, the request channel controller operable to select a second one of plurality request channels according to channel capacities of the plurality of request channels, the request controller operable to transfer the second data packet over the selected second one of the plurality of request channels; the second one of the plurality of channels being different than the first one of the plurality of channels as a result of varying channel capacities.

Jones discloses a receiver sending a credit packet to a transmitter bearing an assigned virtual channel for data transmission **(column 2 lines 45-47 and column 3 lines 19-21)**, where each data packet can only be transmitted to the receiver when a credit packet is issued **(column 3 lines 30-32)**; the transmitter sending data to the

receiver on the virtual channels designated by the credit packets **(column 2 lines 48-51)**, where transmitting data via the plurality of virtual channels results in a more efficient use of bandwidth **(column 1 lines 55-58)**. Although Jones does not explicitly teach varying the bandwidth among the plurality of virtual channels, that particular feature is apparent.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the element of Jones's receiver for sending credit packets to designate a particular virtual channel for transmission from a transmitter into the receiver of both Doshi and Forin. The motivation for such a modification is to provide an improved method and system for transmitting data via a plurality of virtual channels using a more efficient bandwidth.

Regarding claim 7, Doshi discloses the limitations: wherein the request channel controller is operable to generate an increment signal **(column 3 lines 12-16; the count value is advanced to a succeeding value when it is incremented by a clock signal)**, the sequence number unit operable to advance the sequence number in response to the increment signal **(column 3 lines 12-16; the sequence number generator advances the count value to the succeeding number)**.

Regarding claim 8, Forin disclose the limitations: a credit counter unit operable to maintain a number of flow control credits **(column 12 lines 47-50; a credit list reader/processor maintains a list of credits received and used)**.

Regarding claim 9, Forin discloses the limitations: wherein the request channel controller is operable to generate a decrement signal **(column 11 lines 62-64; a**

receiver communicates credits to a sender to control the flow of data packets sent by the sender), the credit counter unit operable to reduce the number of flow control credits in response to the decrement signal **(column 12 lines 47-50; a credit list reader/processor removes a credit from a list once a sender uses that particular credit)**.

Regarding claim 10, Forin disclose the limitations: wherein the credit counter unit is operable to increment the number of flow control credits in response to receipt reply including a flow control credit reply **(column 18 lines 15-21; a credit list builder/communicator communicates a new credit list to the sender when it determines that the data has been received)**.

Regarding claim 11, Doshi discloses the limitations: each data packet including a sequence number **(column 3 lines 17-20; a controller adds a count value as a packet sequence number to a data packet)**, the plurality of packets being received in a non-sequential order **(column 5 lines 9-10; a program determines if the data packet is received in sequence; it is obvious to one of ordinary skill in the art that if a program is needed to check if a packet is in sequence the packets can be received in a non-sequential order)**; storing each of the plurality of data packets in a buffer according to its sequence number **(figure 1 unit 210 and column 4 lines 3-12; packets are stored in a buffer)**; reading the plurality of data packets in sequential order from the buffer according to the sequence number **(column 4 lines 8-14; the controller unloads packets that are in sequence from a buffer)**.

Doshi, however, fails to teach the limitation: generating a flow control credit in response to each of the plurality of data packets being read from the buffer.

Forin discloses a receiver communicating credits indicative of application buffer sizes to a sender **(column 12 lines 50-53)**.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate Forin's credit list builder and reader into Doshi's transmitter and receiver. The motivation for such a modification is to provide an improved method and system for controlling flow between a sender and receiver that alleviate the difficulties of data being lost, overwritten, and/or retransmitted with conventional flow control techniques.

Neither Doshi, Forin, and/or their combination fail to further teach the limitations: receiving a plurality of data packets over different ones of a plurality of channels.

Jones discloses sending data between a transmitter and receiver over a plurality of virtual channels using unique credit packets associated with each virtual channel **(column 2 lines 40-47)**.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the element of Jones's receiver for sending credit packets to designate a particular virtual channel for transmission from a transmitter into the receiver of both Doshi and Forin. The motivation for such a modification is to provide an improved method and system for transmitting data via a plurality of virtual channels using a more efficient bandwidth.

Regarding claim 12, Doshi discloses the limitations: setting a valid bit in response to a data packet being stored in a portion of the buffer associated with the valid bit **(column 4 lines 3-5 and column 4 lines 20-25; the controller sets binary value for each received packet and stores the received packets in a buffer)**.

Regarding claim 13, Doshi discloses a controller that sets a binary value in correspondence with the sequence number in the packet (**column 4 lines 3-8 and column 4 lines 15-20; the controller sets a binary value for each received packet which corresponds to its sequence number and stores the packet in a buffer**); clearing the valid bit in response to a data packet being read from the associated portion of the buffer **(column 4 lines 3-5 and column 4 lines 15-20; the controller sets a binary value for each received packet which corresponds to its sequence number, stores the packet in a buffer, and unloads the packet from the buffer; it is obvious to one having ordinary skill in the art that a bit, i.e. binary value, will reset itself once the state of its packet is completed)**.

Regarding claim 14, Doshi discloses the limitations: wherein the sequence number is used to directly index into the buffer **(column 4 lines 3-8 and column 4 lines 15-20; the controller sets a binary value for each received packet which corresponds to its sequence number and stores the packet in a buffer)**.

2. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doshi et al. (US 5,222,061), hereinafter referred to as Doshi and in view of Jones et al. (US 6,944,173), hereinafter referred to as Jones.

Regarding claim 15, Doshi discloses the limitations: write port controller operable to receive a plurality of data packets in a non-sequential order **(column 5 lines 9-10; a program determines if the data packet is received in sequence; it is obvious to one of ordinary skill in the art that if a program is needed to check if a packet is in sequence the packets can be received in a non-sequential order)**, each data packet including a sequence number **(column 3 lines 17-20; a controller adds a count value as a packet sequence number to a data packet)**; a re-order buffer operable to store the plurality of data packets **(column 4 lines 3-5; packets are stored in a buffer)**, the write port controller operable to place each data packet into the re-order buffer in response to its sequence number **(column 4 lines 5-8; packets are stored in a buffer)**; a valid unit operable to generate a valid bit for each portion of the re-order buffer **(column 4 lines 3-5 and column 4 lines 15-20; the controller tracks received packets in accordance with a bit map and stores the packets in a buffer)**, the valid bit unit operable to set a valid bit for a corresponding portion of the re-order buffer in response to a data packet being stored therein **(column 4 lines 3-5 and column 4 lines 20-25; the controller sets a binary value for each received packet and stores the packet in a buffer)**; and a read port controller operable to provide data packets in a sequential order in response to a valid bit being set **(column 4 lines 5-8 and column 4 lines 20-25; the controller sets a binary value for each received packet in accordance with its sequence number and unloads the packets in sequence)**.

Doshi et al. fails to teach the limitations: over different ones of a plurality of channels.

Jones discloses sending data between a transmitter and receiver over a plurality of virtual channels using unique credit packets associated with each virtual channel **(column 2 lines 40-47)**.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the element of Jones's receiver for sending credit packets to designate a particular virtual channel for transmission from a transmitter into the receiver taught by Doshi. The motivation for such a modification is to provide an improved method and system for transmitting data via a plurality of virtual channels using a more efficient bandwidth.

Regarding claim 16, Jones discloses the limitations: wherein the read port controller is operable to generate a flow control credit in response to providing a data packet from the re-order buffer **(column 2 lines 4-6; a receiver sends a credit packet only when it has a buffer available)**.

Regarding claim 17, Doshi discloses wherein the read port controller is operable to clear the valid bit upon providing a data packet from the re-order buffer **(column 4 lines 3-5 and column 4 lines 15-25; the controller sets a binary value for each received packet which corresponds to its sequence number, stores the packet in a buffer, and unloads the packet from the buffer; it is obvious to one having ordinary skill in the art that a bit, i.e. binary value, will reset itself once the state of its packet is completed).**

Regarding claim 18, Doshi discloses the limitations: wherein the write port controller uses the sequence numbers to directly index the re-order buffer **(column 4 lines 3-5 and column 4 lines 15-20; the controller sets a binary value for each received packet which corresponds to its sequence number and stores the packet in a buffer)**.

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Feben M. Haile whose telephone number is (571) 272-3072. The examiner can normally be reached on 6:00am - 3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

09/29/2006

RICKY NGO
SUPERVISORY PATENT EXAMINER